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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/473,650	12/29/1999	CARL R. STEVENSON	129250-000887/US	1262

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EXAMINER	
ADDY, ANTHONY S	
ART UNIT	**PAPER NUMBER**
2617	

SHORTENED STATUTORY PERIOD OF RESPONSE	MAIL DATE	DELIVERY MODE
3 MONTHS	01/16/2007	PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

If NO period for reply is specified above, the maximum statutory period will apply and will expire 6 MONTHS from the mailing date of this communication.

Office Action Summary	Application No.	Applicant(s)	
	09/473,650	STEVENSON, CARL R.	
	Examiner	Art Unit	
	Anthony S. Addy	2617	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *28 September 2006*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-21* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-21* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

1. This action is in response to applicant's amendment filed on September 28, 2006. **Claims 1-21** are pending in the present application.

Response to Arguments

2. Applicant's arguments with respect to **claims 1-21** have been considered but are moot in view of the new ground(s) of rejection.

Claim Rejections - 35 USC § 103

3. The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.

4. **Claims 1 and 4-7** are rejected under 35 U.S.C. 103(a) as being unpatentable over **Bevan et al., U.S. Patent Number 6,489,923 (hereinafter Bevan)** and further in view of **Feuerstein et al., U.S. Patent Number 6,188,333 (hereinafter Feuerstein)**.

Regarding claim 1, Bevan teaches a wireless communication system (abstract) comprising: a plurality of antennas 20, 22, 30 (figure 3) for use by one receiver (abstract, column 6 lines 57-65, and column 7 lines 8-12 and 35-39); a scanner adapted to scan through the plurality of antennas and provide a signal received from each of the plurality of antennas 20, 22, 30 to the receiver (abstract, column 6 lines 28-35, column 7 lines 8-12 and 35-39 and Fig. 3 [i.e. "***a scanner*** adapted to scan through the plurality of antennas" is met by the teachings of Bevan that, a cyclic switch 32 samples simultaneously or sequentially through an auxiliary DF antenna 30 comprising four array

elements in combination with the well known teaching in the art that a receiving antenna selectably searches or scans for communication channels for reception of channels within a communication system for mobile radio telephone communications]) and to impart Doppler modulation (e.g., Doppler induced bearing bias) onto a received signal, wherein one or more of the received signals from the antennas 20, 22, 30 are severely degraded (e.g., due to high level of Doppler spread, frequency shift or offset, or multipath) (abstract, figure 4, column 2 lines 6-20, column 6 lines 35-42, and column 7 lines 40-45); and a receiver (figures 3 and 4) having direction finding means for determining the bearing of a received signal (i.e., as determined by the beam producing maximum output) (column 4 lines 22-38) in accordance with a phase thereof (abstract, column 2 lines 6-20, column 6 lines 28-62, and column 7 lines 7-39), wherein said receiver is configured to eliminate multipath channel impairments caused at least by the severely degraded signals (e.g., due to high level of Doppler spread, frequency shift or offset, or multipath) (abstract, column 1 line 65 - column 2 line 20, column 6 lines 35-42, and column 7 lines 40-45).

Bevan fails to explicitly teach substantially eliminating mutipath nulls.

In an analogous field of endeavor, Feuerstein teaches a system and method for avoiding nulls in a composite radiation pattern synthesized from a plurality of antenna beams, wherein mutipath nulls are substantially eliminated (see abstract, col. 2, line 66 through col. 3, line 11, col. 3, lines 53-59, col. 9, lines 11-30, col. 11, lines 61-64 and Fig. 6).

It would therefore have been obvious to one of ordinary skill in the art at the time of the invention to modify Bevan with the teachings of Feuerstein, in order to eliminate nulls in a communication system by introducing delays in the signal paths of an antenna array elements as taught by Feuerstein (see abstract, col. 2, line 66 through col. 3, line 11, col. 3, lines 53-59, col. 9, lines 11-30, col. 11, lines 61-64 and Fig. 6).

Regarding claims 4 and 5, Bevan in view of Feuerstein teaches all the limitations of claim 1. Bevan further teaches the plurality of antennas are equidistant and can be spaced equally apart around a circular array (circumference of a circle formed about a center point) (column 4 lines 44-59).

Regarding claim 6, Bevan in view of Feuerstein teaches all the limitations of claim 1. Bevan further teaches the plurality of antennas comprises at least three antennae 20, 22, 30 (figures 3 and 4).

Regarding claim 7, Bevan in view of Feuerstein teaches all the limitations of claim 1. Bevan further teaches the scanner continuously scans and connects each of the plurality of antennae 20, 22, 30 in turn to the receiver for a substantially equal period of time (dwell time T) (column 7 lines 8-12).

5. **Claims 2 and 3** are rejected under 35 U.S.C. 103(a) as being unpatentable over **Bevan et al., U.S. Patent Number 6,489,923 (hereinafter Bevan)** and **Feuerstein et al., U.S. Patent Number 6,188,333 (hereinafter Feuerstein)** as applied to claim 1 above, and further in view of **Schuchman et al., U.S. Patent Number 6,148,195 (hereinafter Schuchman)**.

Regarding claims 2 and 3, Bevan in view of Feuerstein teaches all the limitations of claim 1 except that scan rate of the scanner is at least 100 hertz or at least 2000 hertz.

In the same field of endeavor, Schuchman et al. further show and disclose that a cellular telephone (wireless) communication system, comprising, among other components, an antenna resolver 40 (scanner) (figure 11) adapted to scan through a plurality of antennas SA1-SAN and provide a signal received from each of the plurality of antennas SA1-SAN to a receiver (column 6 lines 40-55) wherein the scan rate of the antenna resolver 40 (scanner) (figure 11) for scanning each of the plurality of antennas SA1-SAN is at least 100 hertz (at least 2000 hertz for the plurality of antennas SA1-SAN) (figure 10 and column 6 lines 22-39).

Therefore, it would have been obvious to a person of ordinary skill in the art at the time the invention was made to incorporate the scan rate used by Schuchman et al. into the system of Bevan and Feuerstein for the purpose of optimal sampling of each of the antennas 20, 22, 30.

6. **Claims 8-17, 20, and 21** are rejected under 35 U.S.C. 103(a) as being unpatentable over **Bevan et al., U.S. Patent Number 6,489,923 (hereinafter Bevan)** and **Feuerstein et al., U.S. Patent Number 6,188,333 (hereinafter Feuerstein)** and **Borras et al., U.S. Patent Number 5,303,240 (hereinafter Borras)** and further in view of **Sole et al., U.S. Patent Number 6,150,987 (hereinafter Sole)**.

Regarding claims 8, 9 and 13, Bevan teaches a method for communication in a wireless communication environment (see abstract) comprising: providing a common transceiver with a plurality of antennas 20, 22, 30 (figure 3, column 6 lines 57-62, and column 7 lines 8-12); continuously scanning through the said plurality of antennas 20, 22, 30 for a substantially fixed period of time (e.g., dwell time T) by connecting each of the plurality of antennas 20, 22, 30 to a receiver and to impart Doppler modulation (e.g., Doppler induced bearing bias) onto a received signal (abstract, figure 4, column 2 lines 6-20, column 6 lines 35-42, column 7 lines 8-12 and 35-45 and Fig. 3 [i.e. "continuously scanning through the said plurality of antennas 20, 22, 30" is met by the teachings of Bevan that, a cyclic switch 32 samples simultaneously or sequentially through an auxiliary DF antenna 30 comprising four array elements in combination with the well known teaching in the art that a receiving antenna selectably searches or scans for communication channels for reception of channels within a communication system for mobile radio telephone communications]); and determining the bearing of the received signal (i.e., as determined by the beam producing maximum output) (column 4 lines 22-38) in accordance with a phase thereof (abstract, column 2 lines 6-20, column 6 lines 28-62, and column 7 lines 7-39).

Bevan fails to explicitly teach substantially eliminating mutipath nulls caused at least by severely degraded received signal samples in a substantially stationary wireless communication environment.

In an analogous field of endeavor, Feuerstein teaches a system and method for avoiding nulls in a composite radiation pattern synthesized from a plurality of antenna

beams, wherein mutipath nulls are substantially eliminated (see abstract, col. 2, line 66 through col. 3, line 11, col. 3, lines 53-59, col. 9, lines 11-30, col. 11, lines 61-64 and Fig. 6).

It would therefore have been obvious to one of ordinary skill in the art at the time of the invention to modify Bevan with the teachings of Feuerstein, in order to eliminate nulls in a communication system by introducing delays in the signal paths of an antenna array elements as taught by Feuerstein (see abstract, col. 2, line 66 through col. 3, line 11, col. 3, lines 53-59, col. 9, lines 11-30, col. 11, lines 61-64 and Fig. 6).

However, Bevan in view of Feuerstein fails to explicitly teach the plurality of antennas 20, 22, 30 are operated as a phased array during a transmit mode.

Borras clearly show and disclose a communication system for determining the direction for transmitting and receiving a signal comprising an array of phased antennas 10 (figure 2) used for receiving as well as transmitting a signal (see column 2 lines 51-66 and claims 1, 4, 5, 7-9, and 12-16).

Therefore, it would have been obvious to a person of ordinary skill in the art at the time the invention was made to modify the teachings of Bevan and Feuerstein with the teachings of Borras, in order to use the plurality of antennas as a phased array during a transmission mode. Efficient use of the system gain can be achieved by using the antennas as a phased array during a transmit mode.

However, the combination of Bevan, Feuerstein and Borras fails to explicitly teach the wireless communication environment is a substantially stationary or quasi-

stationary wireless communication environment (claim 9) such as a wireless local loop (claim 13).

Sole clearly show and disclose an antenna assembly and a method for communicating using said assembly in a substantially stationary or quasi-stationary wireless communication environment such as a wireless local loop, said method including, among other steps, the steps of scanning an antenna and finding the bearing of a received signal (see abstract, column 1 line 55 - column 2 line 47, column 3 lines 40-59, and column 4 lines 17-28 and 47-65).

Therefore, it would have been obvious to a person of ordinary skill in the art at the time the invention was made to further modify the combined teachings of Bevan, Feuerstein and Borras with the teachings of Sole to use said method of communication in a substantially stationary or quasi-stationary wireless communication environment such as, for example, a wireless local loop, as taught by Sole et al., for the purpose of enhancing the performance in said environment.

Regarding claims 10, 11, 12, 14, 15, 16 and 17, the combination of Bevan, Feuerstein, Borras and Sole teaches all the limitations of claim 9 except that the quasi-stationary wireless communication environment is a wireless local area network, a cordless telephone or modem, a cellular or PCS telephone, a trunked mobile radio system or a mobile satellite communications system.

Nonetheless, the Examiner takes Official Notice of the fact that all the above-mentioned environments are well known wireless communication environments and

Bevan (abstract), Feuerstein (abstract) and Borras (abstract and column 1 lines 6-9) disclose that their teachings apply to wireless communications systems.

Therefore, it would have been obvious to a person of ordinary skill in the art at the time the invention was made to apply the combination of Bevan, Feuerstein, Borras and Sole in any of the above-mentioned well known environments in the art for the purpose of enhancing the performance in any of said environments.

Regarding claims 20 and 21, the combination of Bevan, Feuerstein, Borras and Sole teaches all the limitations of claim 8. Bevan further teaches the plurality of antennas are equidistant and can be spaced equally apart around a circular array (circumference of a circle formed about a center point) (column 4 lines 44-59).

7. **Claims 18 and 19** are rejected under 35 U.S.C. 103(a) as being unpatentable over **Bevan et al., U.S. Patent Number 6,489,923 (hereinafter Bevan)** and **Feuerstein et al., U.S. Patent Number 6,188,333 (hereinafter Feuerstein)** and **Borras et al., U.S. Patent Number 5,303,240 (hereinafter Borras)** and **Sole et al., U.S. Patent Number 6,150,987 (hereinafter Sole)** as applied to claim 8 above, and further in view of **Schuchman et al., U.S. Patent Number 6,148,195 (hereinafter Schuchman)**.

Regarding claims 18 and 19, the combination of Bevan, Feuerstein, Borras and Sole teaches all the limitations of claim 8 except that scan rate of the scanner is at least 100 hertz or at least 2000 hertz.

In the same field of endeavor, Schuchman further show and disclose that a cellular telephone (wireless) communication system, comprising, among other components, an antenna resolver 40 (scanner) (figure 11) adapted to scan through a plurality of antennas SA1-SAN and provide a signal received from each of the plurality of antennas SA1-SAN to a receiver (column 6 lines 40-55) wherein the scan rate of the antenna resolver 40 (scanner) (figure 11) for scanning each of the plurality of antennas SA1-SAN is at least 100 hertz (at least 2000 hertz for the plurality of antennas SA1-SAN) (figure 10 and column 6 lines 22-39).

Therefore, it would have been obvious to a person of ordinary skill in the art at the time the invention was made to incorporate the scan rate used by Schuchman et al. into the method of Bevan, Feuerstein, Borras and Sole for the purpose of optimal sampling of each of the antennas 20, 22, 30.

Conclusion

8. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Anthony S. Addy whose telephone number is 571-272-7795. The examiner can normally be reached on Mon-Thur 8:00am-6:30pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Duc M. Nguyen can be reached on 571-272-7503. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

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